shelving nasals. The lateral palatal grooves are deep in the adult. Third upper molar without any closed triangles and with the middle outer triangle much reduced; this tooth shows therefore the characteristic pattern of the *duodecimcostatus* group.

Four inguinal mammæ.—Five foot-pads on the hind sole.

Dimensions (in millim.), taken from spirit-specimens.

	Head and body.	Tail.	Hind foot.	Ear.
B.M. no. 95.4.29.5 (adult ♂)....	84	25	14·5	7·5
B.M. no. 94.3.19.8 (young ♂) ..	73	24	13	7·5

Dimensions of the Skull.

	94.1.1.16. yg. ad. ♀.	94.1.1.17. ♀ jun.	94.3.19.7. ♀ jun.	94.3.19.8. ♂ jun.
Greatest length	22·9	20·5	20·4	21
Basilar length.....	19·8	..	17·7	18
Length of nasals	6	6	5·5	5·8
„ upper molar series .	6	5·5	5·3	5·5
„ lower „ „ .	5·9	5·4	5·7	5·4
Zygomatic breadth.....	14	12·6	12·4	12·5
Mastoid breadth.	10	..	9·7	10·2
Height at occipital.....	6	..	5·3	5·5
Height between bulla and occipital	8	7	7·5	8·7
Fronto-palatal height.....	8	6·8	7	7·5

Type specimen, B.M. no. 94. 1. 1. 16, young adult ♀ (spirit-specimen). Villalva, Lugo, Galicia (N.W. Spain).

LXVII.—*On the Preorbital Pit in the Skulls of Domestic Horses and Quaggas.* By R. I. Pocock, F.L.S., F.Z.S., Superintendent of the Zoological Society's Gardens.

In the 'Annals' for last November (p. 317), when criticising Mr. Lydekker's statements and opinions with regard to the presence of a preorbital pit upon the skulls of horses and quaggas and the systematic value claimed for it, I remarked that its known occurrence in two true quaggas' skulls would to a certain extent justify a provisional generalisation as to its constancy in that animal, were it not that this pit belongs to the category of characters which are likely to appear sporadically as atavisms and are therefore, from the systematic standpoint, open to suspicion on the score of inconstancy; and I added that "such characters are of

doubtful value as a basis for the formation of natural groups, for functionless vestiges have seldom much importance in taxonomy." This was written on the assumption of the correctness of the claim that the depression is the remains or vestige of the much larger pit which, in more archaic forms, e g. *Hipparion,* lodged, it is held, a facial gland comparable to that of Cervidæ. My conclusion as to the systematic value of the character in question was, and still remains, I believe, quite sound, although I do not think the hypothesis that has been put forward as to its significance can be accepted as substantiated by the facts ; and, until we get further evidence on the point, I incline to the view that Sir William Flower was probably right in saying that no trace of the preorbital depression seen in the skull of *Hipparion* is to be found [in the adults] of any of the existing species of Equidæ.

For the purpose of testing the frequency of the presence of this depression in horses and of ascertaining, if possible, by rough dissection, if any gland be discoverable over the spot, I examined this area of the skull in several horses slaughtered in the Zoological Society's Gardens for food.

My methods of investigation were not precise enough to justify a denial of the existence of a vestige of a gland; but I failed to detect any difference between the subcutaneous tissue overlying the depression when it was present and that overlying the corresponding area of the skull when it was absent. As for the depression itself, it is sometimes present, but more often absent : it exhibits, indeed, every gradation between a hollow perceptible to the eye and touch and a perfectly flat bony surface. From this hollow or from the corresponding area of the skull arises a long muscle which passes forwards to supply the upper lip and nose; and I believe that its sole significance is to give an increase of surface for the attachment of muscular fibres. If this be so, variation in the extent to which the depression may be developed is exactly what would be expected.

It is possible, but hardly, I think, probable, that the very large preorbital pit in *Hipparion* was also an area for muscular attachment. Its appearance and structure suggest no such function; and there is practically nothing in the formation of the naso-premaxillary region of the skull pointing to the possession by this extinct equine of a larger or more flexible upper lip, requiring an increased muscular supply, than is found in recent members of the family.

On the other hand, a comparison between casts of the skulls of *Hipparion* and *Onohippidium* forcibly suggests that

the facial pits in these two genera are homologous structures, despite their difference in position. The pit of *Onohippidium* is larger even than that of *Hipparion* and lies higher on the face, in correlation with the extremely elevated fronto-nasal region of the skull. But in both the casts of the skull of the former genus that I have seen there may be noticed, a little below and in front of the orbit, an additional, quite shallow depression, forcibly recalling, both in position and development, the preorbital muscular depression that exists in some skulls of recent Equidæ.

This pit is well developed in the skull of the quagga in the British Museum, and is also shown, as Dr. Forsyth Major has pointed out, in the drawing of a quagga's skull published by de Blainville. From these two data Mr. Lydekker felt justified in concluding that it is a constant characteristic of quaggas' skulls; and, believing in its absence from the skulls of Burchell's Zebras, he went a step further and used the character as a basis for separating specifically the Quaggas from the Burchell Zebras. This latter opinion was easily refuted by the demonstration of the presence of the pit in a skull of a specimen of Grant's race of Burchell's Zebra: and I am now in a position to state that the conclusion as to the constancy of the occurrence of the pit in quaggas' skulls was also too hastily established; for in the Museum of the Royal College of Surgeons there are skulls of two stallion quaggas, and in neither of them is a trace of the depression perceptible *.

PROCEEDINGS OF LEARNED SOCIETIES.

GEOLOGICAL SOCIETY.

January 4th, 1905.—J. E. Marr, Sc.D., F.R.S., President, in the Chair.

The following communication was read:—

'The Marine Beds in the Coal-Measures of North Staffordshire.' By John T. Stobbs, Esq., F.G.S. With Notes on their Palæontology by Wheelton Hind, M.D., B.S., F.R.C.S., F.G.S.

Owing to the disposition of the rocks and other causes, the stratigraphical position of the marine beds can be located with exactness *in situ*, and a large quantity of material can be obtained for examination. The horizons can be utilized for the identification of coal-seams and for the subdivision of the Coal-Measures, as they are remarkably persistent, and can be frequently traced not only

* I am indebted to Mr. R. H. Burne for the opportunity of examining these two skulls and also casts of the skulls of *Hipparion* and *Onohippidium*.